

# Multi TOPLED® Common Anode

## LHG T680



Abgekündigt nach PD\_078\_02  
Obsolete acc. to PD\_078\_02

### Besondere Merkmale

- **Gehäusotyp:** weißes P-LCC-4 Gehäuse; Kontrasterhöhung durch schwarze Oberfläche
- **Besonderheit des Bauteils:** additive Farbmischung durch unabhängige Ansteuerung aller Chips
- **Wellenlänge:** 645 nm (hyper-rot), 570 nm (grün)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** AlGaAs (hyper-rot), GaP (grün)
- **optischer Wirkungsgrad:** 3 lm/W (hyper-rot), 2,5 lm/W (grün)
- **Gruppierungsparameter:** Lichtstärke
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten und Wellenlöten (TTW)
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 8-mm Gurt mit 8000/Rolle, ø330 mm

### Anwendungen

- Anzeigen im Innenbereich (z.B. in Laufschriftanzeigen)
- 3-Farb-Anzeigen (rot-gelb-grün)
- Leuchtdiodenchips getrennt ansteuerbar
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Einkopplung in Lichtleiter
- Für automobiler Anwendungen nicht geeignet
- Gleiche Pinbelegung wie LHGB T686

### Features

- **package:** white P-LCC-4 package; higher contrast by a black surface
- **feature of the device:** additive mixture of color stimuli by independent driving of each chip
- **wavelength:** 645 nm (hyper-red), 570 nm (green)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** AlGaAs (hyper-red), GaP (green)
- **optical efficiency:** 3 lm/W (hyper-red), 2.5 lm/W (green)
- **grouping parameter:** luminous intensity
- **assembly methods:** suitable for all SMT assembly methods
- **soldering methods:** IR reflow soldering and TTW soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 8 mm tape with 8000/reel, ø330 mm

### Applications

- indoor displays (e.g. light writing displays)
- 3-color-displays (red-yellow-green)
- LED chips can be controlled separately
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- coupling into light guides
- not suitable for automotive applications
- same pin layout like LHGB T686

Typ Type	Emissionsfarbe Color of Emission	Lichtstärke Luminous Intensity		Bestellnummer Ordering Code
		$I_F = 10 \text{ mA}$ $I_V \text{ (mcd)}$		
		hyper-red	green	
■LHG T680	hyper-red	11.2 ...28.0	7.1 ... 28.0	on request
■LHG T680-L+K	green	11.2 ...18.0	7.1 ... 11.2	
■LHG T680-L+L		11.2 ...18.0	11.2 ... 18.0	
■LHG T680-L+M		11.2 ...18.0	18.0 ... 28.0	
■LHG T680-M+K		18.0 ...28.0	7.1 ... 11.2	
■LHG T680-M+L		18.0 ...28.0	11.2 ... 18.0	
■LHG T680-M+M		18.0 ...28.0	18.0 ... 28.0	

Helligkeitswerte werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von  $\pm 11 \%$  ermittelt.  
Luminous intensity is tested at a current pulse duration of 25 ms and a tolerance of  $\pm 11 \%$ .

- Abgekündigt nach PD\_078\_02 / Obsolete acc. to PD\_078\_02  
Letzte Bestellung / Last Order: 30.09.2003  
Letzte Lieferung / Last Delivery: 31.03.2004

*Anm.: Die Standardlieferform von Serientypen beinhaltet eine Familiengruppe. Einzelne Helligkeitsgruppen sind nicht bestellbar.  
In einer Verpackungseinheit / Gurt ist immer nur eine Helligkeitsgruppe pro Farbe enthalten.*

*Note: The standard shipping format for serial types includes a family group. Individual luminous intensity groups cannot be ordered.  
No packing unit / tape ever contains more than one luminous intensity group per color.*

**Grenzwerte**  
**Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Werte Values		Einheit Unit
		LH	LG	
Betriebstemperatur Operating temperature range	$T_{op}$	- 40 ... + 100		°C
Lagertemperatur Storage temperature range	$T_{stg}$	- 40 ... + 100		°C
Sperrschichttemperatur Junction temperature	$T_j$	+ 100		°C
Durchlassstrom Forward current ( $T_A=25^\circ\text{C}$ )	$I_F$	30		mA
Stoßstrom Surge current $t \leq 10 \mu\text{s}$ , $D = 0.005$ , $T_A=25^\circ\text{C}$	$I_{FM}$	0.5		A
Sperrspannung <sup>1)</sup> Reverse Voltage ( $T_A=25^\circ\text{C}$ )	$V_R$	5	12	V
Leistungsaufnahme Power consumption ( $T_A=25^\circ\text{C}$ )	$P_{tot}$	90	95	mW
Wärmewiderstand Thermal resistance				
Sperrschicht / Umgebung <sup>2)</sup> Junction / air <sup>2)</sup>	1 chip on $R_{th JA}$	480		K/W
	2 chips on $R_{th JA}$	680		K/W
Sperrschicht / Löt看 Junction / solder point	1 chip on $R_{th JS}$	260		K/W
	2 chips on $R_{th JS}$	370		K/W

<sup>1)</sup> für kurzzeitigen Betrieb geeignet / suitable for short term application

<sup>2)</sup> Montage auf PC-Board FR 4 (Padgröße  $\geq 16 \text{ mm}^2$ )  
mounted on PC board FR 4 (pad size  $\geq 16 \text{ mm}^2$ )

Kennwerte ( $T_A = 25\text{ °C}$ )

## Characteristics

Bezeichnung Parameter	Symbol Symbol	Werte Values		Einheit Unit
		LH	LG	
Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 10\text{ mA}$	$\lambda_{\text{peak}}$	660	572	nm
Dominantwellenlänge <sup>1)</sup> (typ.) Dominant wavelength $I_F = 10\text{ mA}$	$\lambda_{\text{dom}}$	645	570	nm
Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.) Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 10\text{ mA}$	$\Delta\lambda$	22	25	nm
Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) (typ.) Viewing angle at 50 % $I_V$	$2\phi$	120	120	Grad deg.
Durchlassspannung <sup>2)</sup> (typ.) Forward voltage (max.) $I_F = 10\text{ mA}$	$V_F$ $V_F$	1.75 2.5	2.0 2.5	V V
Sperrstrom (typ.) Reverse current (max.) $V_R = 12\text{ V (green)}, V_R = 5\text{ V (hyper-red)}$	$I_R$ $I_R$	0.01 10	0.01 10	$\mu\text{A}$ $\mu\text{A}$
Temperaturkoeffizient von $\lambda_{\text{peak}}$ (typ.) Temperature coefficient of $\lambda_{\text{peak}}$ $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{peak}}}$	0.28	0.11	nm/K
Temperaturkoeffizient von $\lambda_{\text{dom}}$ (typ.) Temperature coefficient of $\lambda_{\text{dom}}$ $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{dom}}}$	0.05	0.07	nm/K
Temperaturkoeffizient von $V_F$ (typ.) Temperature coefficient of $V_F$ $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_V$	- 2.5	- 1.4	mV/K
Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 10\text{ mA}$	$\eta_{\text{opt}}$	3	2.5	lm/W

<sup>1)</sup> Wellenlängen werden mit einer Stromeinprägungsdauer von 25 ms und einer Genauigkeit von  $\pm 1\text{ nm}$  ermittelt.  
Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of  $\pm 1\text{ nm}$ .

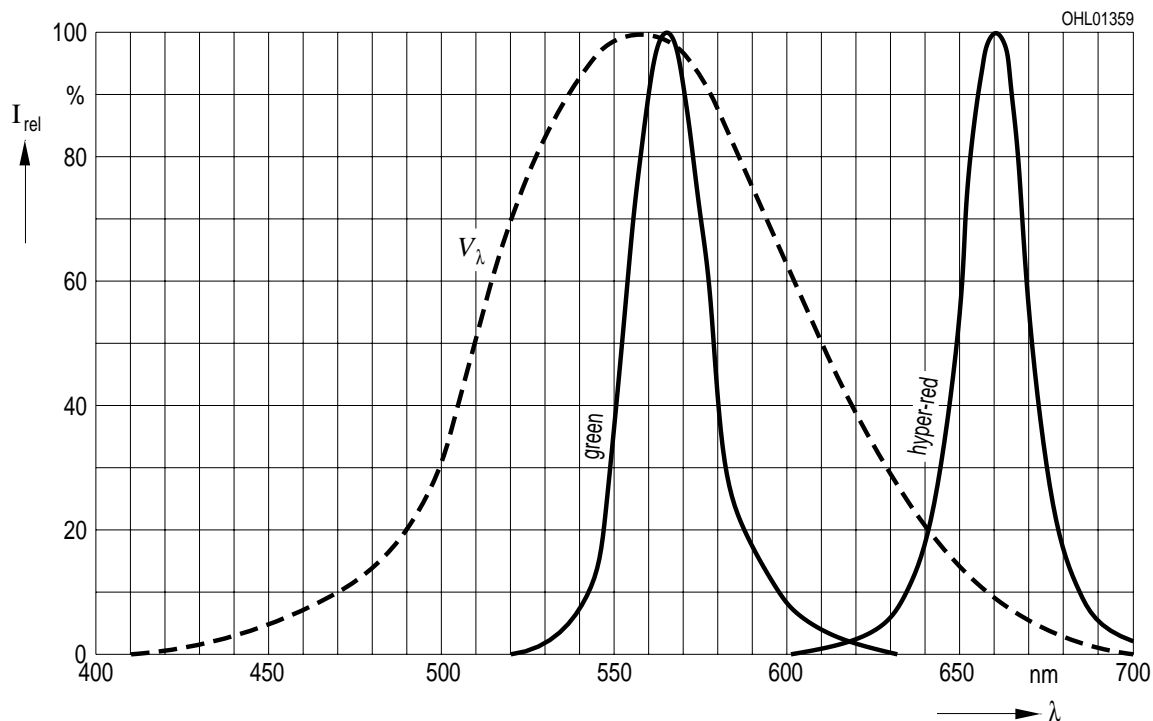
<sup>2)</sup> Spannungswerte werden mit einer Stromeinprägungsdauer von 1 ms und einer Genauigkeit von  $\pm 0,1\text{ V}$  ermittelt.  
Voltages are tested at a current pulse duration of 1 ms and a tolerance of  $\pm 0.1\text{ V}$ .

Relative spektrale Emission  $I_{rel} = f(\lambda)$ ,  $T_A = 25\text{ °C}$ ,  $I_F = 10\text{ mA}$

Relative Spectral Emission

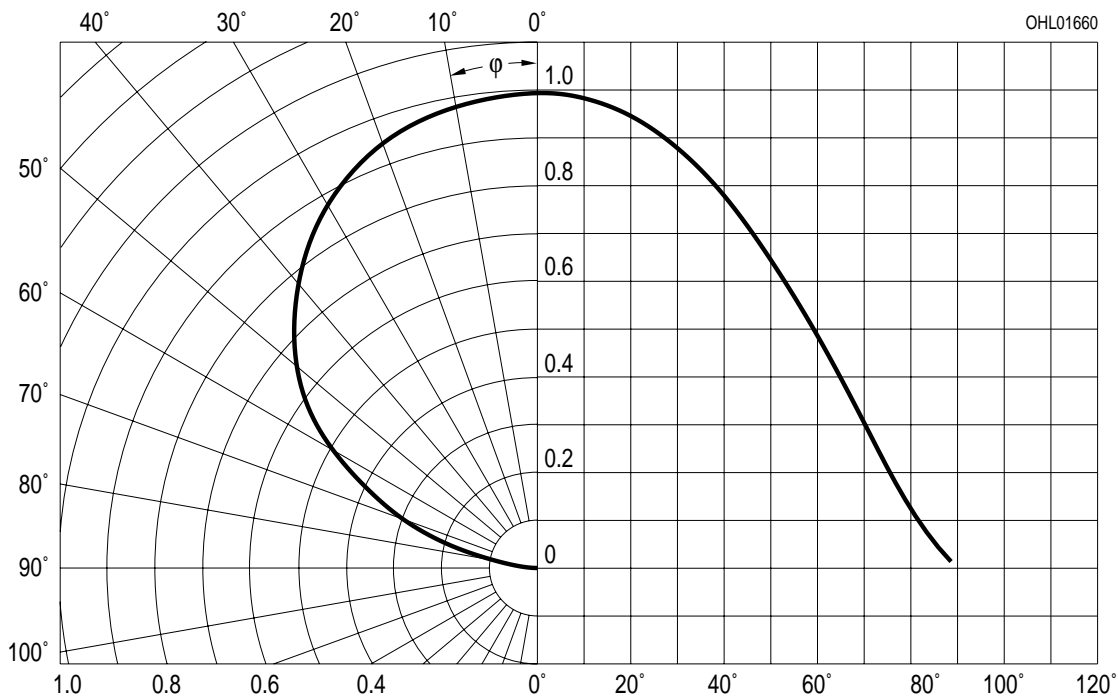
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



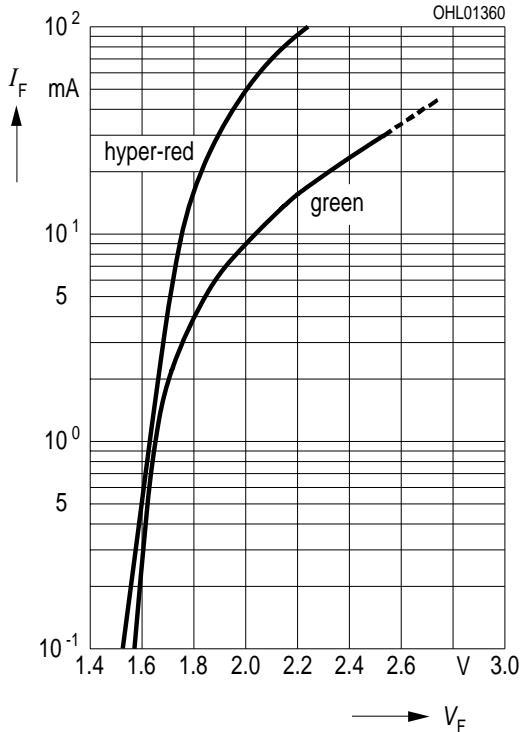
Abstrahlcharakteristik  $I_{rel} = f(\varphi)$

Radiation Characteristic



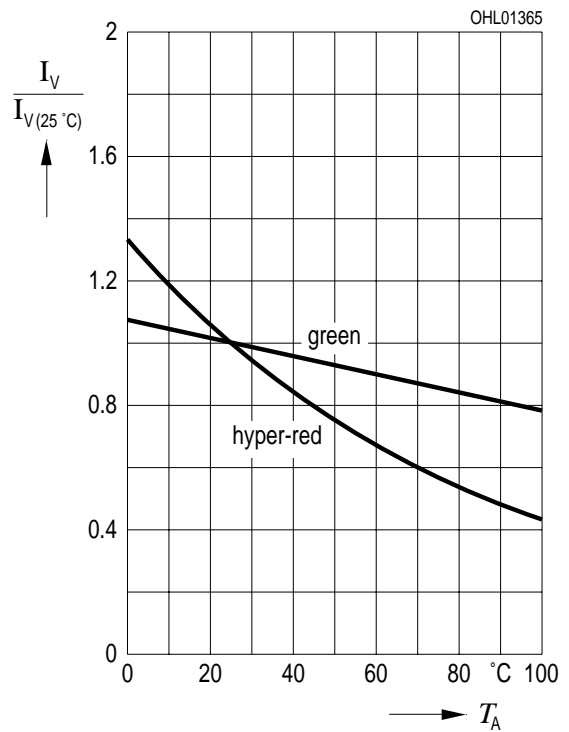
**Durchlassstrom  $I_F = f(V_F)$**   
**Forward Current**

$T_A = 25\text{ }^\circ\text{C}$



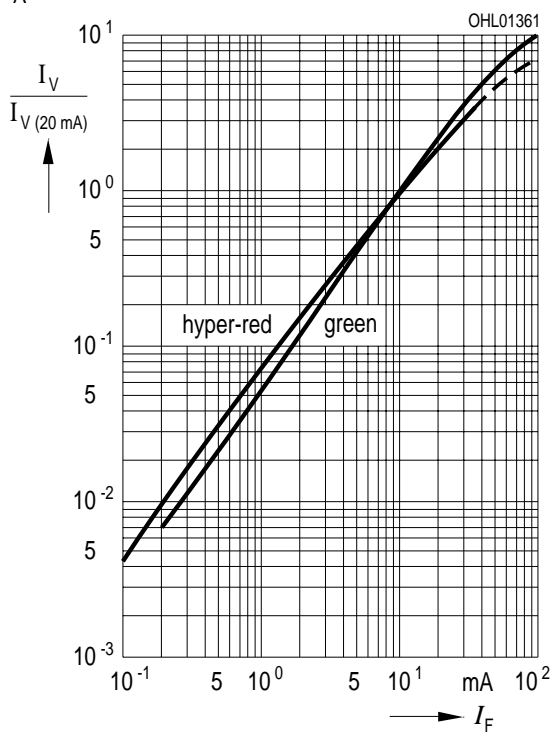
**Relative Lichtstärke  $I_V/I_{V(25\text{ }^\circ\text{C})} = f(T_A)$**   
**Relative Luminous Intensity**

$I_F = 10\text{ mA}$

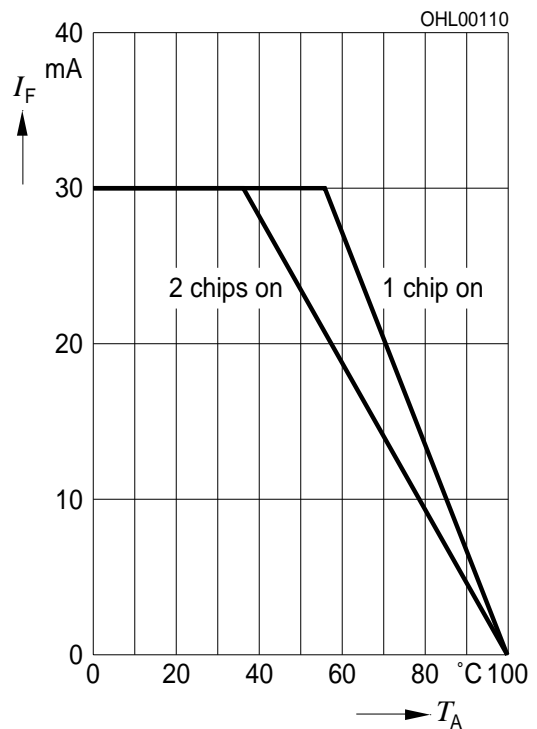


**Relative Lichtstärke  $I_V/I_{V(10\text{ mA})} = f(I_F)$**   
**Relative Luminous Intensity**

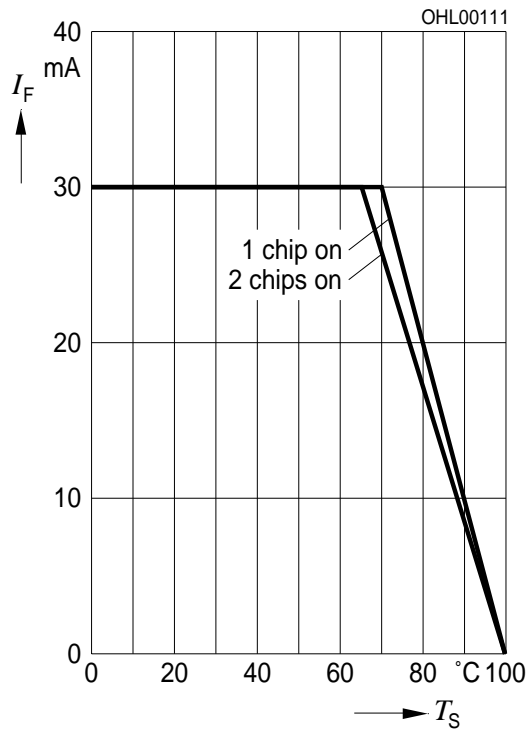
$T_A = 25\text{ }^\circ\text{C}$



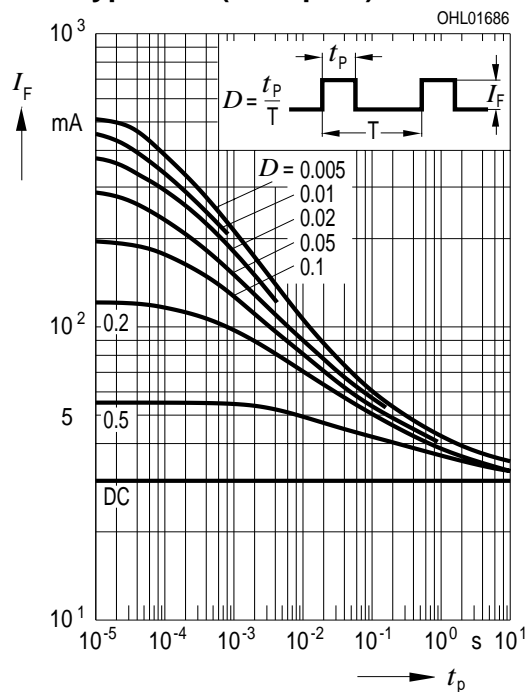
**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**   
**Max. Permissible Forward Current**



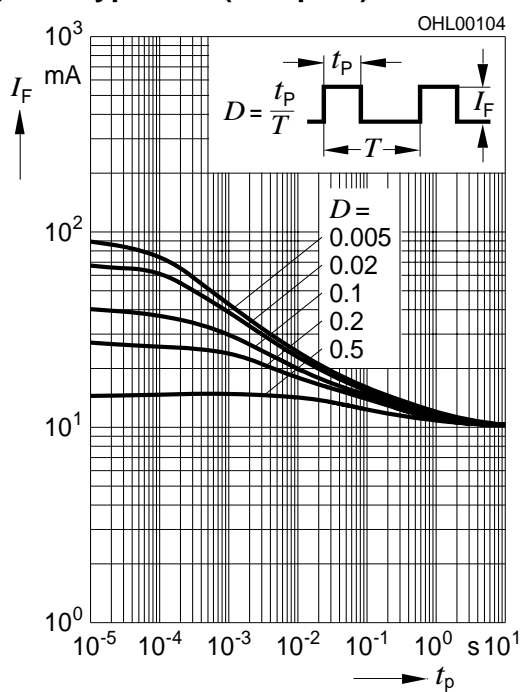
Maximal zulässiger Durchlassstrom  $I_F = f(T)$   
Max. Permissible Forward Current



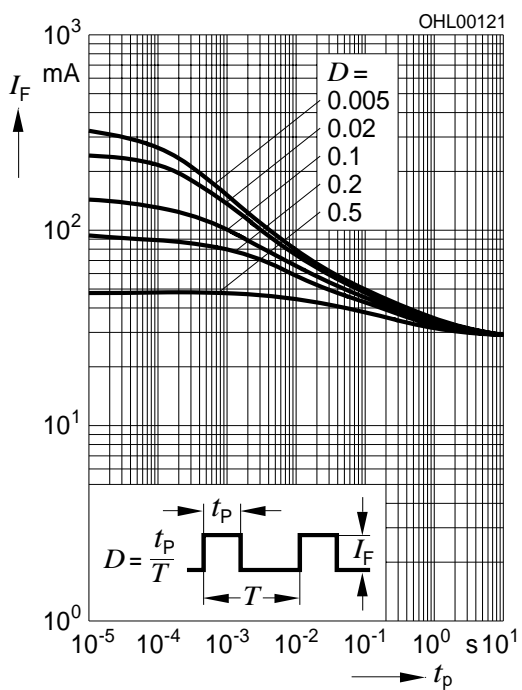
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
**green/hyper-red (1 Chip on)**



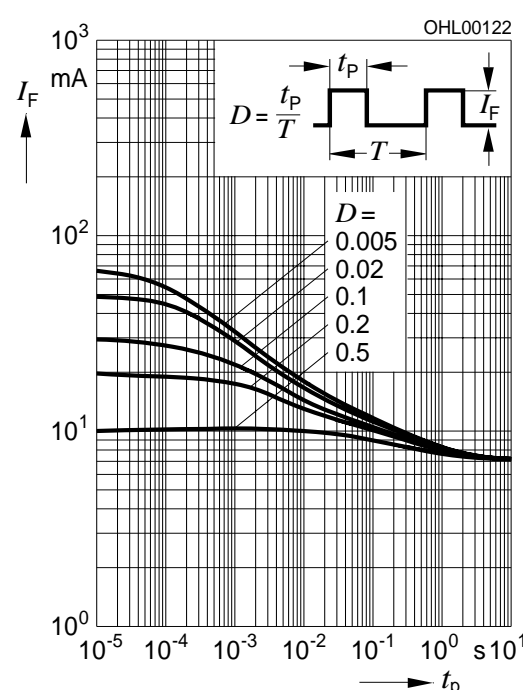
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
**green/hyper-red (1Chip on)**



**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
**green/hyper-red (2 Chips on)**

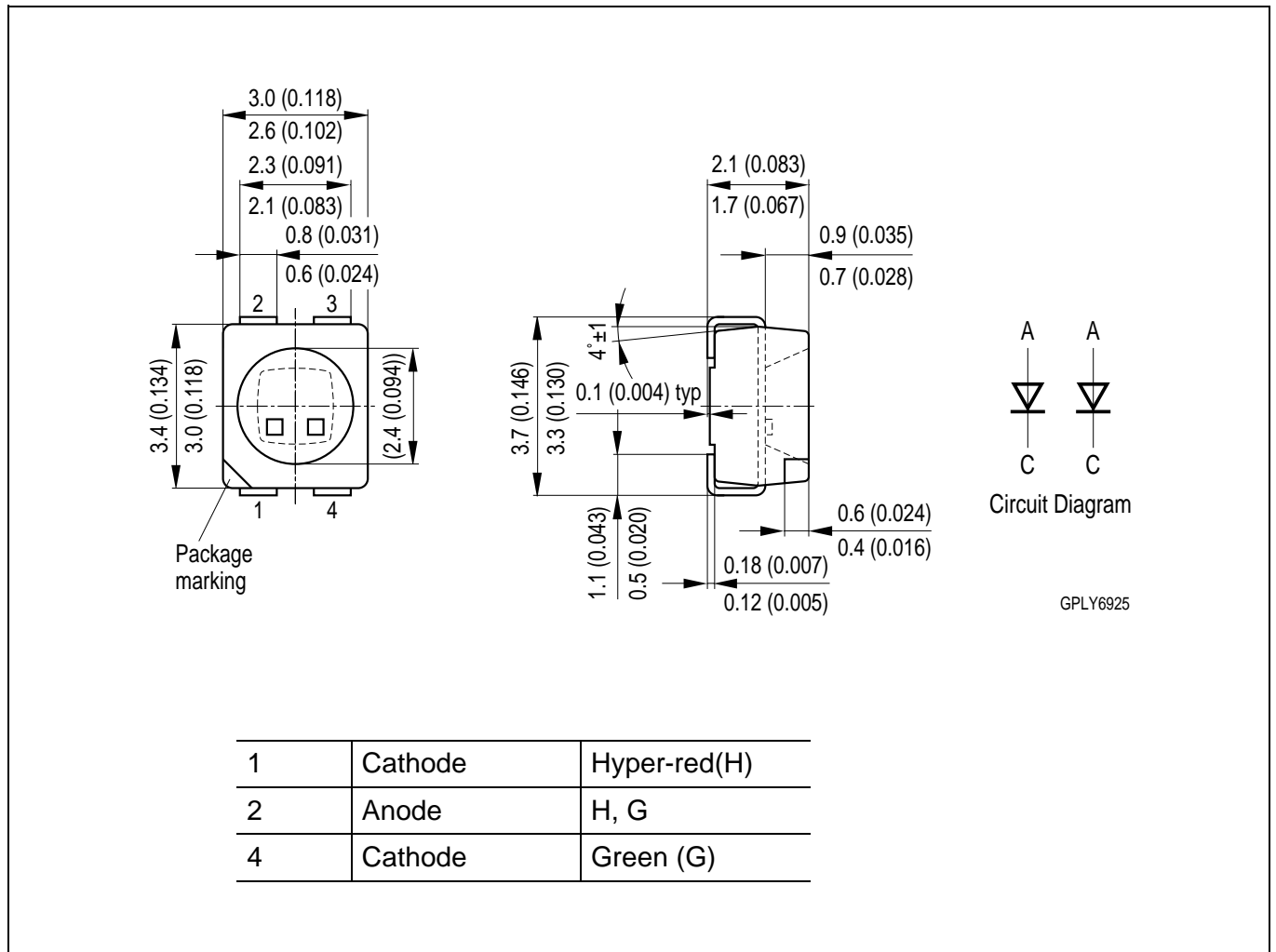


**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
**green/hyper-red (2 Chips on)**





**Maßzeichnung  
Package Outlines**

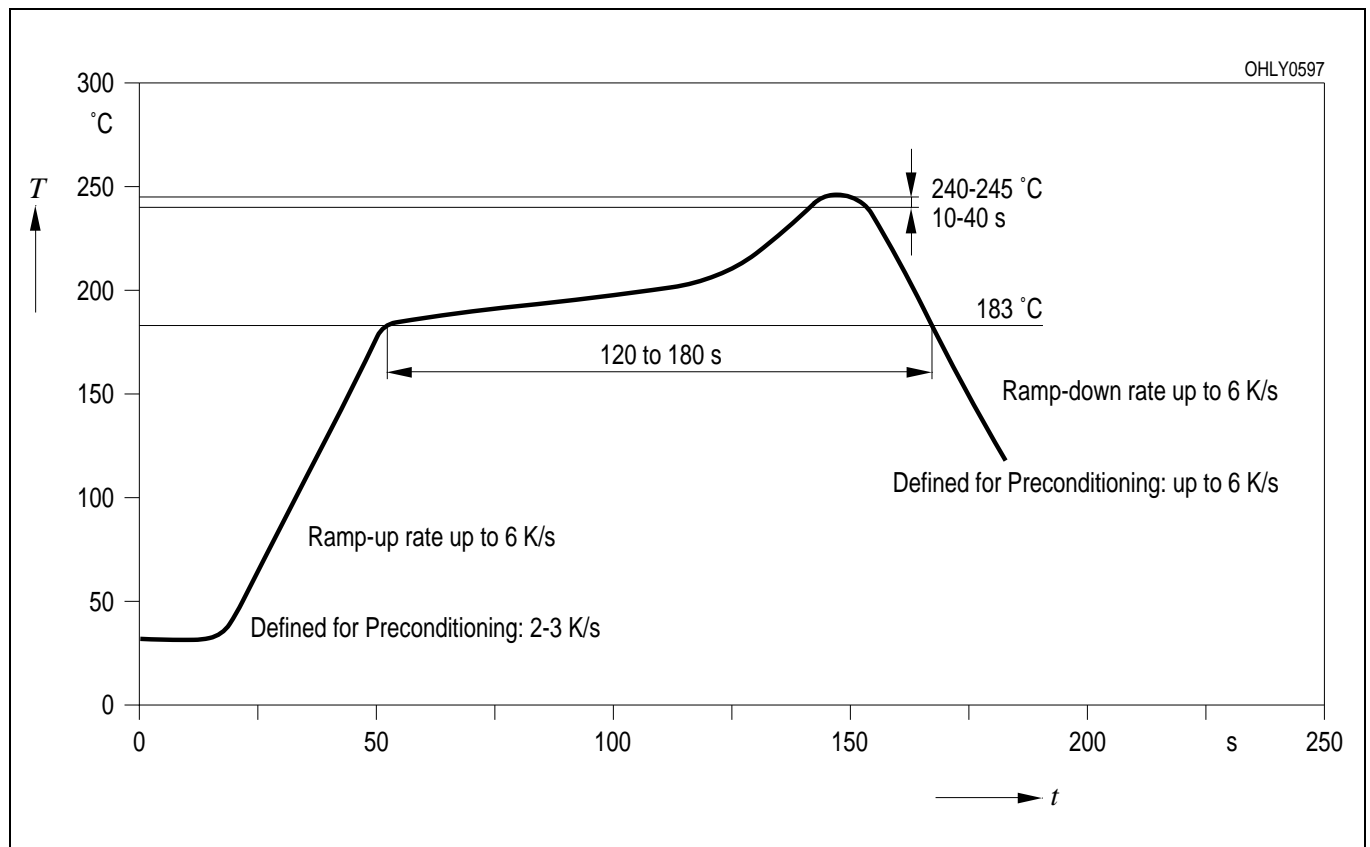


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

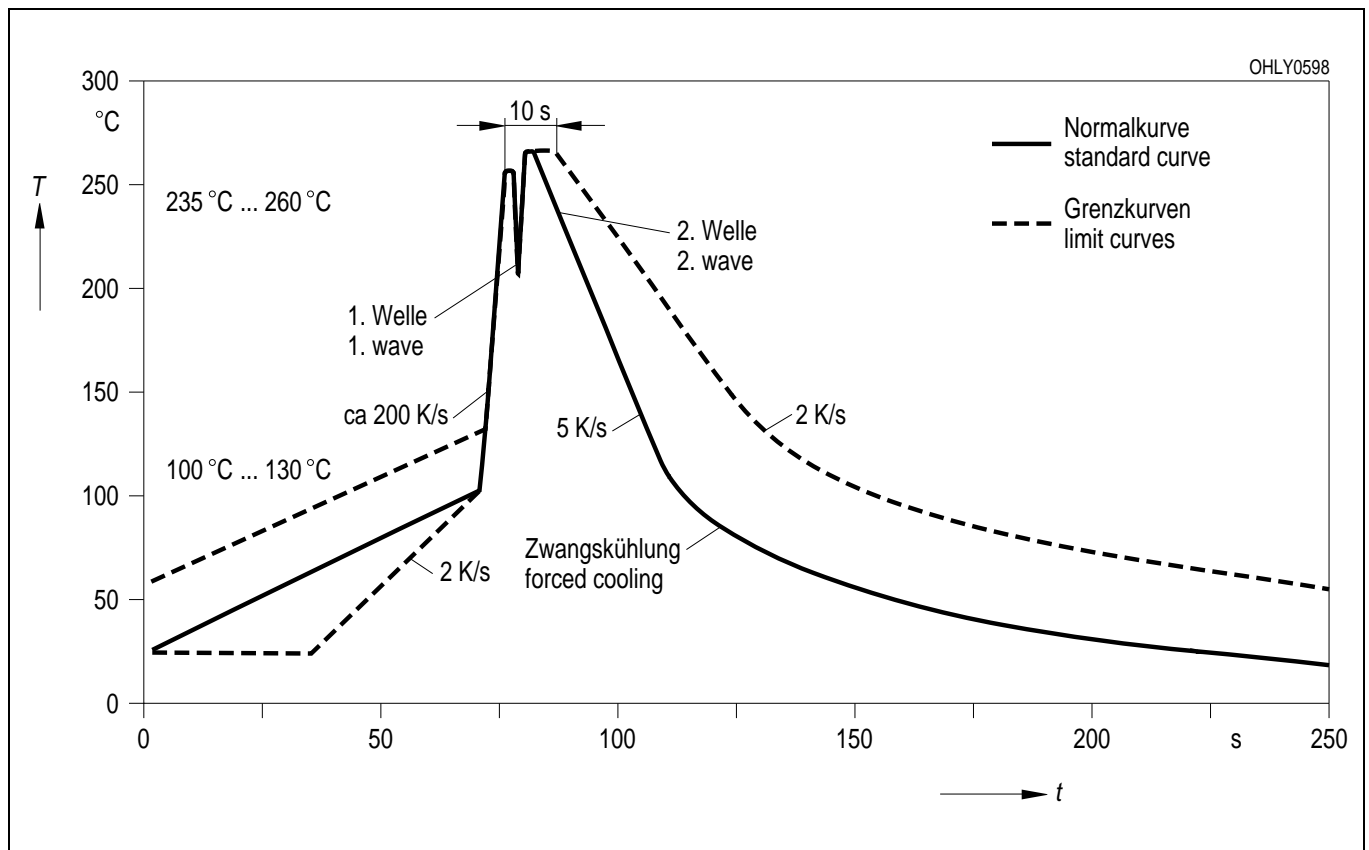
**Gewicht / Approx. weight:** 35 mg

**Lötbedingungen** Vorbehandlung nach JEDEC Level 2  
**Soldering Conditions** Preconditioning acc. to JEDEC Level 2

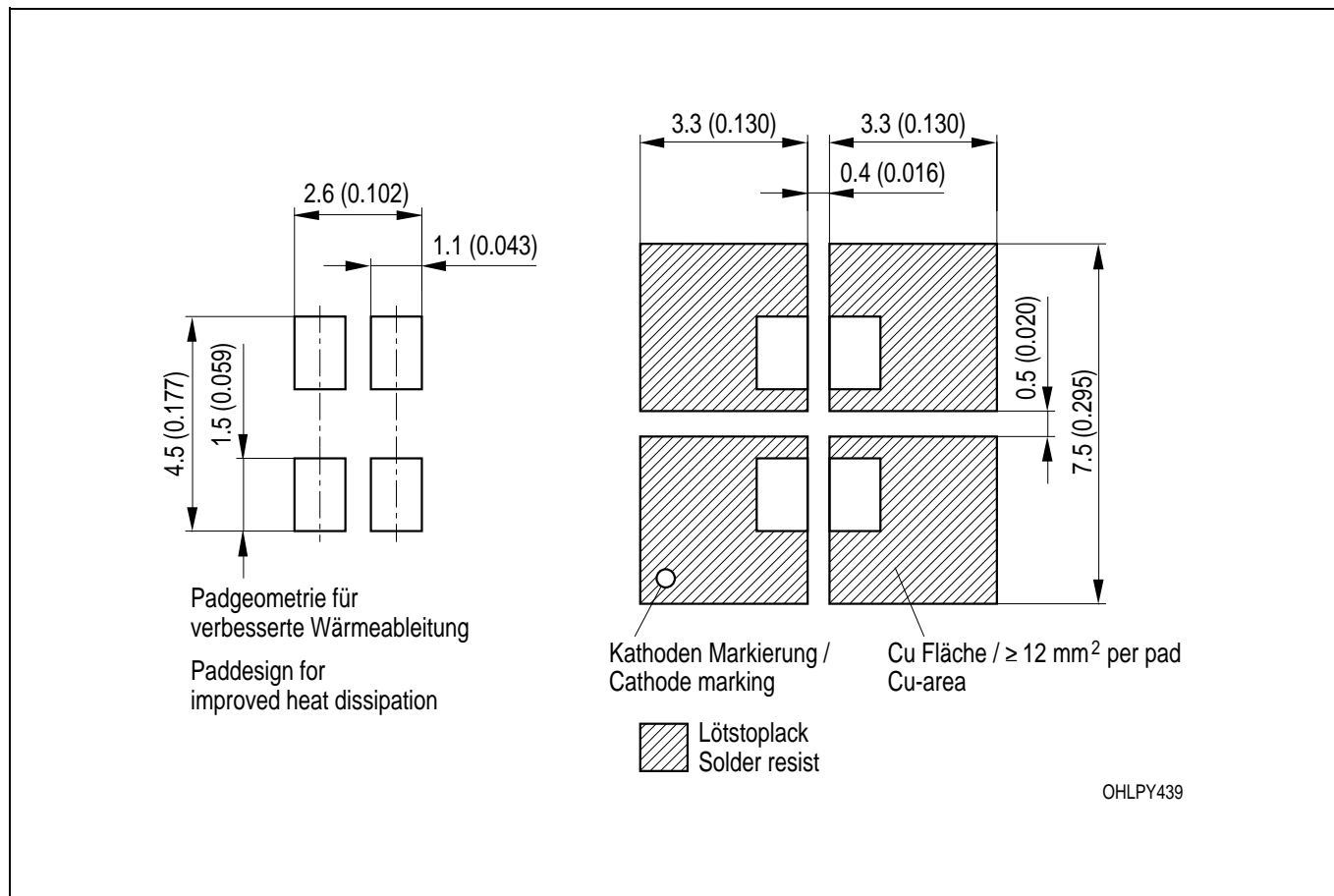
**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)



**Wellenlöten (TTW)** (nach CECC 00802)  
**TTW Soldering** (acc. to CECC 00802)

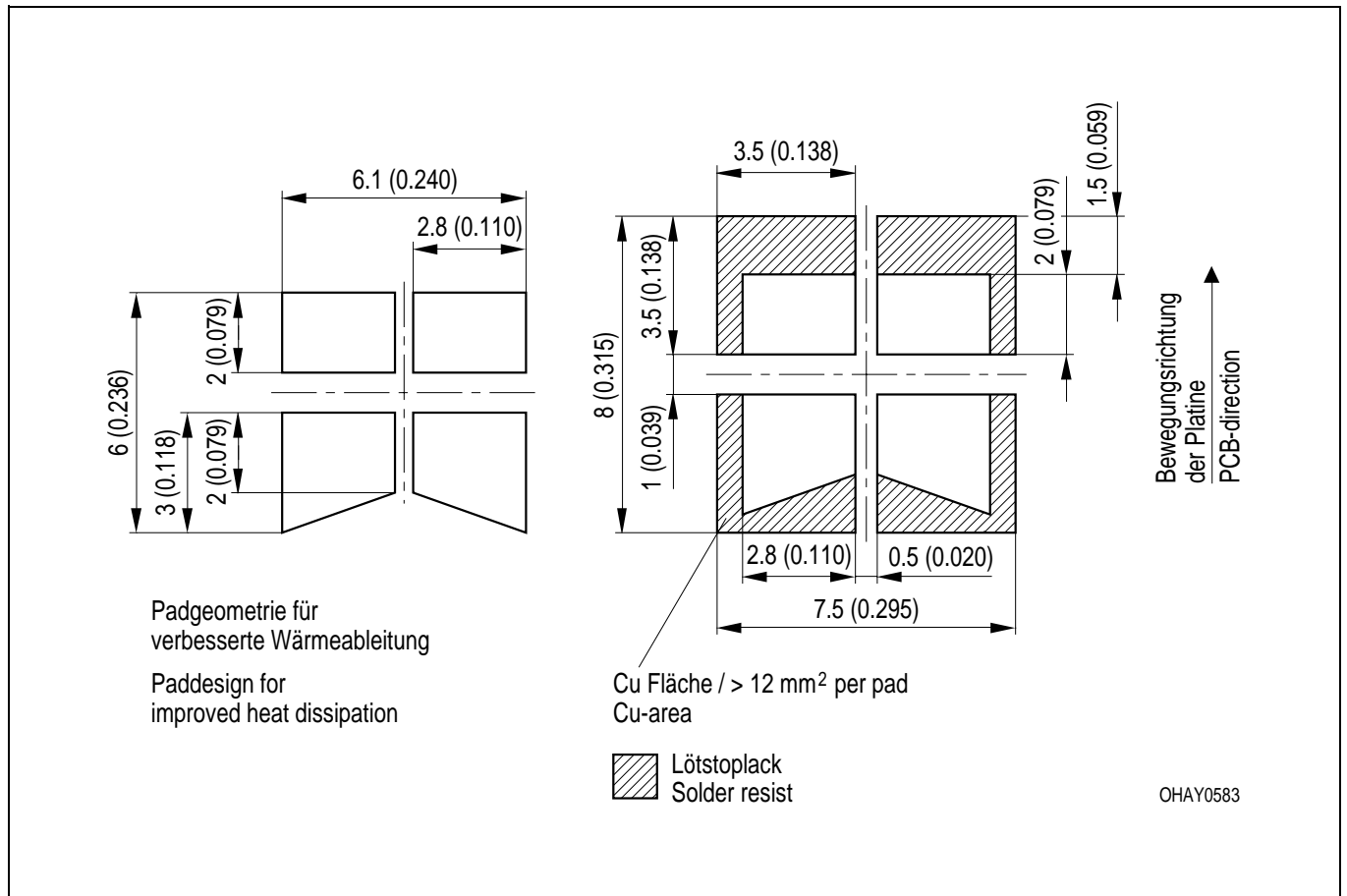


**Empfohlenes Lötpad Design** IR Reflow Löten  
**Recommended Solder Pad** IR Reflow Soldering

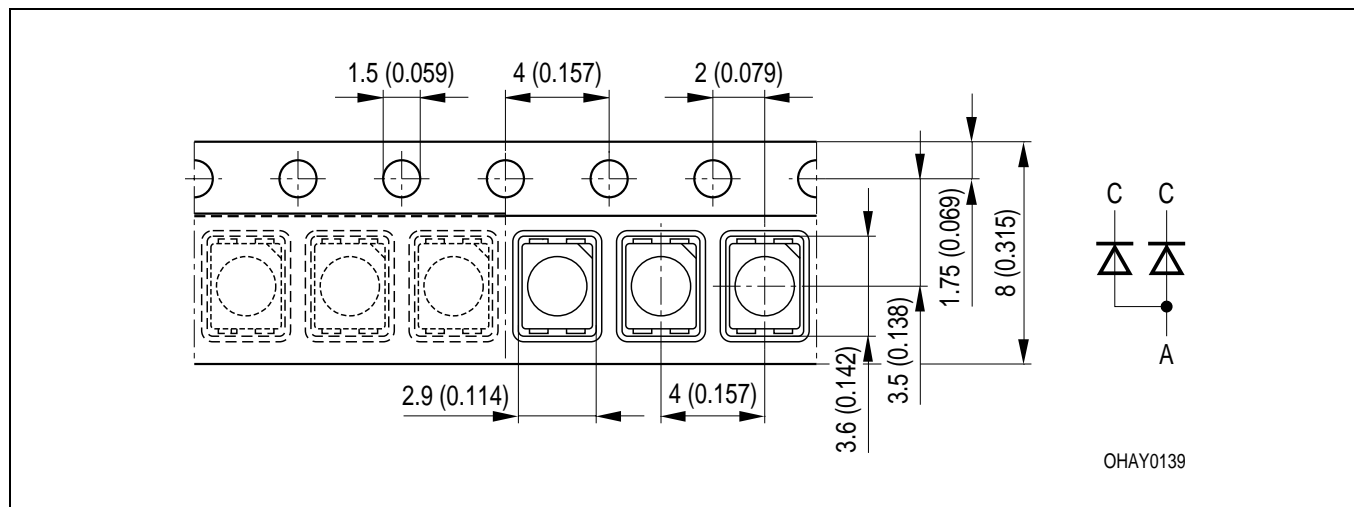


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**Empfohlenes Lötpad design** Wellenlöten (TTW)  
**Recommended Solder Pad** TTW Soldering



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**Gurtung / Polarität und Lage**Verpackungseinheit 8000/Rolle,  $\varnothing$ 330 mm**Method of Taping / Polarity and Orientation**Packing unit 8000/reel,  $\varnothing$ 330 mm

Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

*Anm.: Bezüglich Trockenverpackung finden Sie weitere Hinweise im Internet und in unserem Short Form Catalog im Kapitel "Gurtung und Verpackung" unter dem Punkt "Trockenverpackung". Hier sind Normenbezüge, unter anderem ein Auszug der JEDEC-Norm, enthalten.*

*Note: Regarding dry pack you will find further information in the internet and in the Short Form Catalog in chapter "Tape and Reel" under the topic "Dry Pack". Here you will also find the normative references like JEDEC.*

Revision History: 2003-09-09		Date of change
Previous Version: 2003-08-04		
Page	Subjects (major changes since last revision)	
15	annotations	2002-07-23
3, 4	value (reverse voltage)	2002-09-18
all	not for new designs	2002-11-18
3, 4	hyper-red: value (reverse voltage from 12 V to 5 V)	2003-02-11
1, 2	Obsolete	2003-08-04
14	note: dry pack	2003-09-09
3	ambient temperature	2003-09-09

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#### Attention please!

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#### Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components <sup>1</sup> may only be used in life-support devices or systems <sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

<sup>2</sup> Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.